

Notice of Allowability

Application No.

09/824,512

Examiner

Cameron Saadat

Applicant(s)

PERRY, JOHN S.

Art Unit

3713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 3/3/2005.
2. ☒ The allowed claim(s) is/are 1,2,6-16 and 18.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☒ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 3/17/2005.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

XUAN M. THAI
SUPERVISORY PATENT EXAMINER

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EXAMINER'S COMMENTS

The examiner has cited US Patent 5,042,743 in order to enhance the reviewable record for the claimed terminology "loss exchange ratio" (See Col. 1, lines 40-46). Also see Proctor, *Technical Performance Measures and Distributed-Simulation Training Systems* (P. 23, Col. 2).

Drawings

The following changes to the drawings have been approved by the examiner and agreed upon by applicant:

- Reference numbers 103 and 104 described on P. 17, line 3 of the specification should be directed to Fig. 13.
- Reference numbers 105-108 on Fig. 13 must be described in the specification or removed from the drawings.
- Reference numbers 410, 421, 430, 440, 450, 470, 472, 474, 476, 478, described on P. 21 of the specification must be clearly identified in the drawings.

In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes. In addition, the drawings filed on 4/2/2001 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Brad Pedersen on March 15, 2005.

The application has been amended as follows:

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In the Claims:

Claim 1: line 15, replace “sensitivities modes” with -- sensitivities mode --

Claim 16: line 35, replace “together with a fault indication” with -- . --

Claim 18: line 1, replace “storing” with -- encoded with --

line 2, after “one computer” insert --executable --

REASONS FOR ALLOWANCE

Independent claims 1, 16, 18 and their respective dependent claims 2, 6-15 are allowed. The following is an examiner’s statement of reasons for allowance:

The prior art of record fails to teach the specific combination of elements as claimed. In particular the prior art fails to teach *inter alia*:

As per claim 1, a computer system programmed to implement a causal network model comprising an integrated collection of analysis models representing a model-based description of the weapon system at a subsystem and component level resolution, individual elements of the weapon system being configured as nodes in a causal network suited to model complex interactions and interrelationships with other nodes, including operational and lower-level requirements, system performance and design attributes, and constrained resources, each node including at least one dynamic parameter for creating a virtual representation of the weapon system; a control system operably coupled to the causal network and adapted to control at least one state and at least one mode of operation and to control an optimization process that operates upon the causal network model, the mode including the specifically claimed single-run mode, a dependencies mode, and a sensitivities mode; wherein the optimization process optimizes a weapon system’s combat effectiveness as measured by loss exchange ratio computations; and a virtual simulation system coupled to the causal network model and the control system through an interface, the interface adapted to return data structures from the virtual simulation system to the control system; wherein the virtual simulation system is adapted to simulate the weapon system, including a simulation of

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lethality of a munitions element; and a user interface operably coupled to the computer system for inputting and receiving data.

As per claim 16, an integrated evaluation and simulation computer system for allocating resources across a system architecture of a weapon system having a munitions element to optimize a combat effectiveness of the weapon system, the computer system including: means for inputting and receiving data from the computer system including an interlinked configuration of a control system and causal network model having a plurality of analysis models wherein individual elements of the weapon system are configured as nodes; means for creating a virtual representation of an optimally effective weapon system by generating a causal network model of the weapon system, representing the individual elements of the weapon system as nodes having complex interactions and interrelationships with other nodes, including at least one dynamic parameter; means for propagating selected inputs once through the causal network model in a single run mode to produce a set of intermediate and final results, the single run mode equipped with means for changing one or more of the selected inputs during operation; means for determining a best set of design parameters that satisfy specified performance requirements and resource constraints from a set of user selected design parameters; optimizing the weapon system's combat effectiveness as measured by loss exchange ratio computations; means for rapidly and visually identifying at least one interrelationship between design attributes and performance parameters within the causal network model by providing a means to display performance parameters affected by a change to a user selected input value; means for evaluating weapon system performance in terms of one or more design parameter in the causal network model by evaluating the effects on performance parameters upon varying a user selected design parameter; means for acquiring and the intermediate and final results, the best set of design parameters and the interrelationship between the design attributes and performance parameters from the causal network to generate a visual representation of an optimally effective weapon system; and means for displaying a graphical representation of the system.

As per claim 18, an integrated evaluation and simulation computer system for allocating resources across a system architecture of a weapon system having a munitions element, to optimize a combat effectiveness of the weapon system, including the steps of: generating a causal network model comprising an integrated collection of analysis models representing a model-based description of the weapon system at a subsystem and component level resolution, individual elements of the weapon system being configured as nodes in the causal network suited to model complex interactions and interrelationships with other nodes, including operational and lower-level requirements, system performance attributes, system design attributes, and constrained resources, each node including at least one dynamic parameter for creating a virtual representation of the weapon system; pulsing the causal network model to create the virtual representation of the optimally effective weapon system by: propagating selected data once through the causal network model to produce a set of intermediate and final results; determining a best set of design parameters that satisfy specified performance requirements and resource constraints from a set of user selected design parameters; providing optimization of the weapon system's combat effectiveness as measured by loss exchange ratio computations; identifying at least one interrelationship between user specified design attributes and performance parameters within the causal network model by displaying performance parameters affected upon a change to a user selected input value; computing an effect on one or more user specified performance parameters upon varying a user selected design parameter; selectively sending the virtual representation to a virtual simulation system for simulating weapon system operations; and receiving information about the performance of the weapon system.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

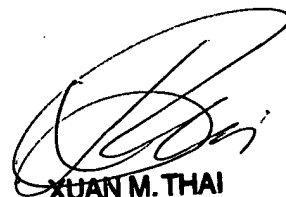
- Carney (USPN 5,042,743) – discloses a definition for the term loss exchange ratio.
- Gilmer (Multitrajectory Simulation Performance for Varying Scenario Sizes) – discloses a multitrajectory method of simulation for exploring a set of all possible outcomes given various events and scenarios.
- Proctor (Technical Performance Measures and Distributed-Simulation Training Systems) – discloses a definition for the term loss exchange ratio.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cameron Saadat whose telephone number is (571) 272-4443. The examiner can normally be reached on M-F 9:00 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xuan Thai can be reached on (571) 272-7147. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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